AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS

1. (Currently Amended) A method of measuring an amount of an organic substance contained within a biological sample utilizing a detection system, ~~said organic substance having an infrared absorption spectrum which includes a set (n) of n wavelength regions, wherein up to n-1 of said wavelength regions each substantially correspond to an absorption band of said organic substance and at least one of said wavelength regions corresponds to a reference wavelength band,~~ comprising:

~~(a) calibrating a detection system with a reference sample;~~

~~(b)~~

(a) transmitting incoherent infrared radiation through a sample;

(b) detecting the intensity of the transmitted radiation[[,]] with an optical sensor[[,]]; ~~the intensity of a number of selected wavelength bands of infrared electromagnetic radiation resulting from filtering of said infrared electromagnetic radiation influenced by said organic substance contained within said biological sample with the detection system and~~

(c) generating an electrical signal in response thereto~~, wherein (i) up to n-1 of said selected wavelength bands each substantially corresponds to an absorption band of said organic substance and (ii) at least one of said selected wavelength bands is a reference wavelength band~~;

(~~c~~d) receiving ~~said~~ the electrical signal with a signal processor configured to process ~~said~~ the electrical signal with a quantification algorithm; and

(~~d~~e) processing ~~said~~ the electrical signal ~~with said mathematical model so as to provide a measurement of the concentration of said organic substance contained within said biological fluid~~ to provide a measure of the amount of the organic substance contained within the sample; wherein,

(i) one or more reference samples, each containing a known amount of the organic substance, are measured thereby calibrating the detection system,

(ii) the biological sample and the reference sample each have an infrared absorption spectrum which includes a set of n selected wavelength regions,

(iii) up to n-1 of the wavelength regions each substantially correspond to an absorption band of the organic substance, and

(iv) at least one of the wavelength regions substantially corresponds to a reference absorption band.

2. (Currently Amended) The method of claim 1, wherein the organic substance is glucose. ~~including detecting the intensity of said selected wavelength bands of infrared electromagnetic radiation resulting from filtering said infrared electromagnetic radiation influenced by glucose with said detection system.~~

3. (Currently Amended) The method of claim 1, ~~including~~ further comprising collecting ~~said~~ the biological sample from a mammal.

4. (Currently Amended) The method of claim 1, wherein:

~~said~~ the quantification algorithm of [[(c)]] (d) includes dividing an ~~first wavelength band~~ integrated absorbance value of one of the wavelength region substantially corresponding to an absorption band of the organic substance by an ~~reference wavelength band~~ integrated absorbance value of one of the wavelength regions substantially corresponding to a reference absorption band, wherein at least one reference wavelength band is contained in the wavelength regions in which said organic substance does not substantially absorb electromagnetic radiation.

5. (Currently Amended) The method of claim 4, wherein:

~~said~~ the quantification algorithm of [[(c)]] (d) further includes dividing an ~~second wavelength band~~ integrated absorbance value of a second wavelength region substantially corresponding to an absorption band of the organic substance by ~~said reference wavelength band~~ the integrated absorbance value of the wavelength region substantially corresponding to the reference absorption band.

6.- 10. (Canceled)

11. (Currently Amended) The method of claim 3 ~~claim 10~~, wherein[[:]] ~~said~~ the mammal is a human.

12 - 15. (Canceled)

16. (Currently Amended) The method of claim 1 ~~claim 9~~, wherein:

~~said number of~~ the set of n selected ~~infrared~~ wavelength ~~bands of (b)~~ regions are within a range ~~defined by~~ from about 7 to 11 microns [1400 cm^{-1} to about 950 cm^{-1}].

17. (Currently Amended) A method of measuring a concentration of an organic substance contained within a biological fluid, ~~said organic substance having an infrared absorption spectrum which includes a set (n) of infrared wavelength regions, wherein up to n-1 of said infrared wavelength regions each substantially correspond to an infrared absorption band of said biological fluid and at least one of said wavelength regions corresponds to a reference wavelength band,~~ comprising:

~~(1) (a)~~ calibrating a detection system by the steps of: ~~with a reference sample;~~

~~(b)~~

(a) detecting, with an optical sensor, the transmittance of ~~a number of~~ n selected wavelength bands ~~of infrared electromagnetic radiation resulting from filtering the infrared electromagnetic radiation absorbed by said organic substance contained within said~~ of incoherent infrared radiation through a reference ~~biological~~ fluid ~~with the detection system, and~~

(b) generating an electrical signal in response thereto, ~~wherein (i) up to n-1 of said selected wavelength bands each substantially corresponds to an absorption band of said biological fluid and (ii) at least one of said selected wavelength bands is a reference wavelength band;~~

(c) receiving ~~said~~ the electrical signal with a signal processor configured to process ~~said~~ the electrical signal with a mathematical model,[[;]] and

(d) processing ~~said~~ the electrical signal ~~with said mathematical model so as to provide a measurement of the concentration of said organic substance contained within said biological fluid.~~ to calibrate the detection system;

(2) utilizing the detection system to give a measure the concentration of the organic substance contained within the biological fluid.

18. (Currently Amended) The method of claim 17, wherein~~:~~

~~(a) includes detecting the transmittance of said selected wavelength bands of electromagnetic radiation absorbed by glucose contained within said biological fluid with said detection system.~~ the organic substance is glucose.

19. (Currently Amended) The method of claim 18, wherein:

~~said~~ the mathematical model utilized to process the electrical signal uses ~~includes the mathematical equation includes mean-centered concentration of glucose in said biological fluid, the mean-centered concentration of glucose in said biological fluid being calculated with~~ the equation:

~~$C_g = P_0 + P_1 IAR_{\lambda,1} + P_2 IAR^2_{\lambda,1}$~~

$C_g = P_0 + P_1 IAR_{\lambda,1} + P_2 IAR^2_{\lambda,1}$

wherein (i) n = 2, (ii) C_g is the mean-centered concentration of glucose in ~~said~~ the ~~biological~~ fluid, (iii) P_i ~~is a~~ are calibration constants, and ~~(iii)~~ (iv) $IAR_{\lambda,1}$ is a mean-centered integrated absorbance ratio of the ~~two of said~~ selected wavelength band[[s]] to the reference wavelength band.

20. (Currently Amended) The method of claim 18, wherein:

~~said~~ the mathematical model utilized to process the electrical signal uses ~~includes the mathematical equation includes mean-centered concentration of glucose in said biological fluid, the mean-centered concentration of glucose in said biological fluid being calculated with~~ the equation:

~~$C_g = P_0 + P_1 IA_{\lambda,1} + P_2 IA^2_{\lambda,1} + P_3 IA^2_{\lambda,1} + P_4 IA^2_{\lambda,2} + P_5 IA_{\lambda,1}$~~

$C_g = P_0 + P_1 IA_{\lambda,1} + P_2 IA_{\lambda,2} + P_3 IA^2_{\lambda,1} + P_4 IA^2_{\lambda,2} + P_5 IA_{\lambda,1} IA_{\lambda,2}$

wherein (i) n = 2, (ii) C_g is the mean-centered concentration of glucose in ~~said~~ the ~~biological~~ fluid, (iii) P_i are calibration constants, and ~~(iii)~~ (iv) $IA_{\lambda,1}$ ~~and $IA_{\lambda,1}$ are~~ is the mean centered integrated absorbance for the selected glucose wavelength band and $IA_{\lambda,2}$ is the mean centered integrated absorbance for the selected reference wavelength band.

21. (Currently Amended) The method of claim 18, wherein:

~~said~~ the mathematical model utilized to process the electrical signal uses ~~includes the mathematical equation includes mean-centered concentration of glucose in said biological fluid, the mean-centered concentration of glucose in said biological fluid being calculated with~~ the equation:

~~$C_g = P_0 + P_1 IA_{\lambda,1} + P_2 IA_{\lambda,2} + P_3 IA^2_{\lambda,1} + P_4 IA^2_{\lambda,2} + P_5 IA_{\lambda,1} IA_{\lambda,2}$~~

$C_g = P_0 + P_1 IAR_{\lambda 1} + P_2 IAR_{\lambda 2} + P_3 IAR^2_{\lambda 1} + P_4 IAR^2_{\lambda 2} + P_5 IAR_{\lambda 1} IAR_{\lambda 2}$

wherein (i) n = 3, (ii) C_g is the mean-centered concentration of glucose in ~~said~~ the ~~biological~~ fluid, (iii) P_i are calibration constants, and ~~(iii)~~ (iv) ~~$IA_{\lambda,j}$~~ $IAR_{\lambda,i}$ is a mean-centered integrated absorbance ratio of ~~two of said~~ the selected wavelength band[[s]] to the reference wavelength band.

22. (Currently Amended) The method of claim 18, wherein:

~~said~~ the mathematical model utilized to process the electrical signal uses ~~includes the mathematical equation includes mean-centered concentration of glucose in said biological fluid, the mean-centered concentration of glucose in said biological fluid being calculated with~~ the equation:

$C_g = P_0 + P_1 IA_{\lambda,1} + P_2 IA_{\lambda,2} + P_3 IA_{\lambda,3} + P_4 IA^2_{\lambda,1} + P_5 IA^2_{\lambda,2} + P_6 IA^2_{\lambda,3} + P_7 IA_{\lambda,1} IA_{\lambda,2} + P_8 IA_{\lambda,2} IA_{\lambda,3} + P_9 IA_{\lambda,1} IA_{\lambda,3}$

wherein (i) n = 3, (ii) C_g is the mean centered concentration of glucose in ~~said~~ the ~~biological~~ fluid, (iii) P_i are calibration constants, and ~~(iii)~~ (iv) $IA_{\lambda,j}$ is the mean centered integrated absorbance for band j.

23. (Currently Amended) A method of measuring an amount of an organic substance contained within a biological sample~~, said organic substance~~ having an infrared absorption spectrum which includes a set of n ~~(n) of~~ absorption ~~wavelength~~ regions, wherein up to n-1 of ~~said wavelength regions each substantially correspond to an~~ the absorption ~~band~~ regions are absorbed by the ~~of said~~ organic substance and at least one of ~~said wavelength regions~~ the absorption regions, a reference absorption region, does not correspond to the absorption regions of the organic substance ~~corresponds to a reference wavelength band~~, comprising:

(a) illuminating ~~said~~ the biological sample with infrared electromagnetic radiation, wherein the infrared electromagnetic radiation is transmitted through the sample, ~~wherein said infrared electromagnetic radiation includes (i) one or more wavelength bands of said infrared electromagnetic radiation resulting from filtering said infrared electromagnetic radiation absorbed by said organic substance contained within said biological sample (ii) one or more reference wavelength bands which are not substantially absorbed by said organic substance contained within said biological sample~~;

(b) selecting ~~a number said wavelength~~ n-1 or less absorption bands ~~of said infrared electromagnetic radiation, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is n-1 or less~~; from the absorption regions absorbed by the organic substance;

(c) selecting ~~a number of~~ 1 or more reference wavelength bands from the absorption regions in which the organic substance does not absorb;

(d) optically detecting the intensity of the transmitted electromagnetic radiation at the n absorption bands ~~only (i) said subset of said selected wavelength bands absorbed by said organic substance contained within said biological sample with a detection system and (ii) said number of reference wavelength bands~~;

(e) generating one or more electrical signals in response to detecting the intensity of ~~only (i) said subset of said selected wavelength bands (ii) said number of reference wavelength~~ the n absorption bands;

(f) receiving ~~said one or more~~ the electrical signals with a signal processor configured to process ~~said~~ the electrical signals with a quantification algorithm; and

(g) processing ~~said one or more~~ the electrical signals with ~~said~~ the quantification algorithm so as to provide a measurement of ~~said~~ the amount of ~~said~~ the organic substance contained within ~~said~~ the biological sample.

24. (Canceled)

25. (Currently Amended) The method of claim 23, wherein n is equal to or less than nine ~~claim 25, further comprising:~~

~~(e) detecting the intensity of one or more reference wavelengths bands of said infrared electromagnetic radiation which are not absorbed by said organic substance contained within said biological sample,~~

~~wherein generating said electrical signal includes generating said electrical signal in response to detecting the intensity of said one or more reference wavelength bands.~~

26. (Currently Amended) A method of measuring an amount of an organic substance contained within a sample, ~~said~~ the organic substance having an infrared absorption spectrum which includes a set (n) of wavelength regions, wherein up to n-1 of ~~said~~ the wavelength regions each substantially correspond to an absorption band of ~~said~~ the organic substance and at least one of ~~said~~ the wavelength regions corresponds to a reference ~~wavelength~~ absorption band, comprising:

(a) calibrating a detection system with a reference sample;

(b) illuminating ~~said~~ the sample with infrared electromagnetic radiation~~, wherein said infrared electromagnetic radiation includes (i) one or more wavelength bands of said infrared electromagnetic radiation resulting from filtering said infrared electromagnetic radiation absorbed by said organic substance contained within said sample (ii) one or more reference wavelength bands which are substantially not absorbed by said organic substance contained within said sample~~;

(c) ~~selecting a number said wavelength bands of said infrared electromagnetic radiation, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is n-1 or less;~~ filtering the electromagnetic radiation such that only radiation which corresponds to the n wavelength regions reaches a detector;

(d) ~~selecting a number of reference wavelength bands; and~~

(~~e~~) ~~optically~~ detecting with the ~~detection system~~ detector the intensity of ~~only (i) said subset of said selected wavelength bands absorbed by said organic substance contained within said sample and (ii) said number of reference wavelength bands~~ the transmitted radiation.

27. (Currently Amended) A method of measuring an amount of an organic substance contained within a biological sample, ~~said~~ the organic substance having an infrared absorption spectrum which includes a set (n) of wavelength regions, wherein up to n-1 of ~~said~~ the wavelength regions substantially correspond to an absorption band of ~~said~~ the organic substance and at least one of ~~said~~ the wavelength regions corresponds to a reference wavelength band, comprising:

(a) calibrating a detection system with a ~~reference~~ set of reference samples;

(b) illuminating ~~said~~ the biological sample with infrared electromagnetic radiation, wherein ~~said~~ the infrared electromagnetic radiation includes (i) one or more discrete wavelength bands ~~of said infrared electromagnetic radiation resulting from~~ selected by filtering ~~of said~~ the electromagnetic radiation ~~which is~~ to correspond with the wavelength absorption bands ~~absorbed by said~~ of the organic substance contained within ~~said~~ the biological sample and (ii) one or more discrete reference wavelength bands selected by filtering the electromagnetic radiation ~~which are~~ to correspond with a wavelength region not substantially ~~not~~ absorbed by ~~said~~ the organic substance contained within ~~said~~ the biological sample;

~~(c) selecting a number said wavelength bands of said infrared electromagnetic radiation, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is a subset of (n);~~

~~(d) selecting a number of reference wavelength bands;~~

(~~e~~c) optically detecting with the detection system the intensity of ~~said~~ the infrared electromagnetic radiation transmitted through the biological sample; and

(~~f~~d) processing with a mathematical model ~~spectral data only from (i) said subset of said~~ the intensity of transmitted infrared electromagnetic radiation of the discrete absorption bands corresponding to the organic substance absorption bands and the reference absorption bands ~~selected wavelength bands absorbed by said organic substance contained within said biological sample and (ii) said number of reference wavelength bands~~.

28. (Currently Amended) A method for determining a patient glucose level, comprising:

(1) obtaining a sample of [[a]] cell-free[[,]] blood-based body fluid in a sample container having a pre-defined measurement path;

(2) passing ~~an incident~~ infrared ~~signal~~ radiation through ~~said~~ the sample and sample container over ~~said~~ the pre-defined measurement path to an optical detector, wherein ~~said incident signal comprises~~ the optical detector measures the intensity of radiation at less than 10 discrete ~~at least two glucose absorbance~~ wavelength bands, wherein:

(a) at least one of the wavelength bands corresponds to an absorption band of glucose,

(b) at least one of the wavelength bands does not correspond to an absorption band of glucose,

(c) each wavelength band has ~~having~~ a ~~thickness~~ bandwidth of at least 140 nm ~~in said measurement range and at least one reference band resulting from filtering of said incident infrared upon passing through said sample~~, and

(d) the infrared radiation ~~said incident signal~~ is modulated;

(3) optically detecting the infrared radiation ~~a signal comprising all three of said bands after said incident signal is absorbed by said sample~~ using [[a]] the optical detector ~~configured to preferentially detect said modulated signal relative to unmodulated signals~~; ~~and~~

(4) generating one or more electrical signals in response to detecting the infrared radiation; and

(5) calculating the patient glucose level by utilizing a calibration curve established with a series of samples with known glucose concentrations ~~in said sample from said post-absorbance signal~~.

29. (Currently Amended) The method of claim 28, wherein ~~said~~ the body fluid is plasma, serum, or interstitial fluid.

30. (Currently Amended) The method of claim 29, wherein ~~said~~ the body fluid is interstitial fluid.

31. (Currently Amended) The method of claim 28, wherein ~~said~~ the sample is transported from a source location at or inside a patient body to ~~a measurement location outside a patient body and said measurement~~ the sample container ~~is present at said measurement location~~.

32. (Currently Amended) The method of claim 30, wherein ~~said~~ the source location is at an implanted needle site, a subcutaneous membrane surface, or a skin surface subjected to ionoporation, microporation, or reverse ionophoresis.

33. (Currently Amended) The method of claim 30, wherein ~~said~~ the interstitial fluid is filtered to remove proteins prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

34. (Currently Amended) The method of claim 33, further comprising removing at least 80% of ~~said~~ the proteins prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

35. (Currently Amended) The method of claim 34, wherein ~~the~~ removing at least 80% of ~~siad~~ the proteins comprises removing at least 96% of ~~said~~ the proteins prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

36. (Currently Amended) The method of claim 35, wherein the removing at least 96% of ~~siad~~ the proteins comprises removing at least 98% of ~~said~~ the proteins prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

37. (Currently Amended) The method of claim 29, further comprising passing ~~said~~ the body fluid through a filter having a molecular weigh cut off in a range from 10 kD to 100 kD prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

38. (Currently Amended) The method of claim 29, wherein the passing ~~said~~ the body fluid further comprises passing ~~said~~ the body fluid through a filter having a molecular weigh cut off in a range from 10 kD to 40 kD prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

39. (Currently Amended) The method of claim 29, wherein the passing ~~said~~ the body fluid further comprises passing ~~said~~ the body fluid through a filter having a molecular weight cut off in a range from 10 kD to 25 kD prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

40. (Currently Amended) The method of claim 28, wherein ~~said~~ the measurement path has a length in a range from 5 to 60 microns.

41. (Currently Amended) The method of claim 40, wherein ~~said~~ the measurement path has a length in a range from 15 to 35 microns.

42. (Currently Amended) The method of claim 28, wherein ~~said two glucose absorbance bands are a first and a second glucose absorbance band~~ two wavelength bands corresponding to absorption bands of glucose are selected so that ~~said~~ the first glucose absorbance band ~~includes an absorption band of~~ has a first absorbance ratio for an interfering substance potentially present in ~~said~~ the body fluid and ~~said~~ the second glucose absorbance band ~~includes a second absorbance band of said~~ has a second absorbance ratio for the interfering substance, wherein ~~absorbances of said interfering substance in said absorbance bands are different from each other~~ the first and second absorbance ratios are different from each other.

43. (Currently Amended) The method of claim 42, wherein ~~said incident signal further comprises~~ a third wavelength band corresponding to a glucose absorbance band is selected so that ~~said~~ the third glucose absorbance band ~~includes an absorbance band of said~~ has an absorbance ratio for a second interfering substance potentially present in ~~said~~ the body fluid.

44. (Currently Amended) The method of claim 42, wherein ~~said~~ the interfering substance is lactic acid, a lactate salt, ascorbic acid, an ascorbate salt, mannitol, acetaminophen, ethanol, or a phosphate salt.

45. (Currently Amended) The method of claim 43, wherein ~~said~~ the interfering substance is lactic acid or a lactate salt and ~~said~~ the second interfering substance is ascorbic acid, an ascorbate salt, mannitol, acetaminophen, ethanol, or a phosphate salt.

46. (Currently Amended) The method of claim 33, wherein ~~said two glucose~~ the wavelength bands are selected to be within or to overlap ranges selected from 1090 cm^{-1} to 1075 cm^{-1} [9.174 to 9.302 microns], 1175 cm^{-1} to 1137 cm^{-1} [8.511 to 8.795 microns], and 1180 cm^{-1} to 1170 cm^{-1} [8.475 to 8.547 microns].

47. (Currently Amended) The method of claim 33, wherein ~~said two glucose~~ the wavelength bands are selected to be within or to overlap ranges selected from a band having a center at 1261 cm^{-1} or a wavelength of 7.930 microns and a bandwidth of 170 nm from 1275 cm^{-1} to 1248 cm^{-1} [7.845 to 8.015 microns], a band having a center at 1073 cm^{-1} or a wavelength of 9.320 microns and a bandwidth of 400 nm from 1096 cm^{-1} to 1050 cm^{-1} [9.120 to 9.520 microns], and a band having a center at 1200 cm^{-1} or a wavelength of 8.330 microns and a bandwidth of 140 nm from 1211 cm^{-1} to 1190 cm^{-1} [8.260 to 8.400 microns].

48. (Currently Amended) The method of claim 30, wherein ~~said two glucose~~ the wavelength bands are selected to be within or to overlap ranges selected from a band having a center at 1040 cm^{-1} or a wavelength of 9.62 microns and a bandwidth of 200 nm from 1050 cm^{-1} to 1029 cm^{-1} [9.52 to 9.72 microns], a band having a center at 1085 cm^{-1} or a wavelength of 9.22 microns and a bandwidth of 200 nm from 1096 cm^{-1} to 1073 cm^{-1} [9.12 to 9.32 microns], a band having a center at 1160 cm^{-1} or a wavelength of 8.62 microns and a bandwidth of 200 nm from 1174 cm^{-1} to 1147 cm^{-1} [8.52 to 8.72 microns], a band having a center at 1109 cm^{-1} or a wavelength of 9.02 microns and a bandwidth of 200 nm from 1121 cm^{-1} to 1096 cm^{-1} [8.92 to 9.12 microns], and a band having a center at 1364 cm^{-1} or a wavelength of 7.33 microns and a bandwidth of 200 nm from 1383 cm^{-1} to 1346 cm^{-1} [7.23 to 7.43 microns].

49. (Currently Amended) The method of claim 28, wherein ~~said~~ the fluid is interstitial fluid, wherein ~~said~~ the interstitial fluid is transported from a source location at or inside a patient body to a measurement location outside a patient body and ~~said~~ the measurement container is present at ~~said~~ the measurement location, wherein ~~said~~ the interstitial fluid is passed through a filter having a molecular weight cut off in a range from 10 kD to 40 kD prior to passing ~~said~~ the infrared signal through ~~said~~ the sample, wherein ~~said~~ the measurement path has a length in a range from 20 to 30 microns, and wherein ~~said~~ the post-absorbance signal contains glucose absorbance date from a region from 8.3 to 10.3 microns.

50. (Currently Amended) The method of claim 28, wherein ~~said modulated signal~~ the infrared radiation is modulated by varying ~~one of~~ the current, the voltage, or the frequency provided to the device that generates the ~~incident~~ infrared ~~signal~~ radiation.

51. (Currently Amended) The method of claim 28 wherein ~~said incident signal~~ the infrared radiation is modulated by the periodic insertion of an infrared blocking material ~~an IR chopper~~ that has alternative windows formed from transparent and blocking (opaque) sections.

52. (Currently Amended) The method of claim 50 further comprising performing a second modulation technique ~~on the infrared signal~~, wherein the second modulation technique consists of modulating the infrared radiation by the periodic insertion of an infrared blocking material that has alternative windows formed from transparent and blocking (opaque) sections.

53. (Currently Amended) The method of ~~claim 51 further comprising performing a second modulation technique on the infrared signal~~ claim 28, wherein the infrared radiation is modulated by the periodic insertion of an infrared blocking material that has alternative windows formed from transparent, reference, and blocking (opaque) sections and the infrared radiation is modulated by varying the current, the voltage, or the frequency provided to the device that generates the infrared radiation.

54. (Currently Amended) The method of claim 50 wherein the infrared radiation is modulated at a frequency from 01. Hz to 10 Hz ~~and the second modulation technique includes placing and removing a radiation absorbing material in the pathway of the infrared signal~~.

55. (Currently Amended) The method of claim 54 wherein ~~the modulated signal is the emitter output modulated at~~ the infrared radiation is modulated at a frequency of 3 Hz.

56. (Currently Amended) The method of claim 28, wherein the sample container has a window made from a material ~~is~~ selected from the group consisting of: barium fluoride, silicon and zinc selenide.

57. (Currently Amended) A method for determining a patient glucose level, comprising:

(1) calibrating a detector;

(2) obtaining a sample of a biological fluid in a sample container having a path of defined path length for the transmission of infrared ~~absorption~~ radiation;

(3) transmitting modulated mid infrared radiation through ~~said~~ the sample ~~along said path, wherein (a)~~ such that the infrared radiation is absorbed by glucose in the sample ~~said incident signal comprises at least two glucose absorbance bands and at least one reference band, and (b) said transmitted radiation is modulated~~;

(4) detecting, with an optical sensor configured to detect modulated radiation, radiation ~~from said~~ corresponding to at least two glucose absorbance bands each having a ~~thickness~~ bandwidth of at least 140 nm and ~~said~~ radiation corresponding to at least one reference band ~~resulting from filtering radition after said radiation is absorbed by said sample using a detector configured to detect said modulated radiation~~ and generating an electrical signal in response to detecting ~~said~~ the modulated radiation, wherein the optical sensor uses spectral filtering channels; ~~and~~

(5) receiving ~~said~~ the electrical signal with a signal processor configured to process the electrical signal with a quantification algorithm; and

(6) processing ~~said~~ the electrical signal with ~~said~~ the quantification algorithm, thereby providing a measurement of glucose contained within the ~~biological~~ sample.

58. (Currently Amended) The method of claim 57, wherein ~~said~~ the mid infrared radiation comprises wavelengths in a range of from 7 to 11 microns [1200 cm^{-1} to 900 cm^{-1}].

59. (Currently Amended) The method of claim 57, wherein ~~said~~ the biological fluid is plasma, serum, or capillary filtrate fluid.

60. (Currently Amended) The method of claim 59, wherein ~~said~~ the biological fluid is capillary filtrate fluid.

61. (Currently Amended) The method of claim 60, wherein ~~said~~ the sample of capillary filtrate fluid is transported from a subcutaneous location to ~~said~~ the sample ~~cell~~ container.

62. (Currently Amended) The method of claim 59, wherein ~~said~~ the capillary filtrate fluid is filtered prior to passing ~~said~~ the infrared ~~signal~~ radiation through ~~said~~ the sample.

63. (Currently Amended) The method of claim 62, wherein ~~said~~ the capillary filtrate fluid is passed through an ultrafiltration membrane at a subcutaneous location of ~~said~~ the patient.

64. (Currently Amended) The method of claim 63, wherein ~~said~~ the ultrafiltration membrane passes organics having less than 3000 molecular weight.

65. (Currently Amended) The method of claim 64, wherein ~~said~~ the membrane has a molecular weigh cut off of ~~30~~ in a range from 10 kD to 40 kD.

66. (Currently Amended) The method of claim 57, wherein ~~said~~ two wavelength ~~glucose absorbance~~ bands, corresponding to absorption bands of glucose, are selected so that ~~a~~ the first glucose absorbance band ~~includes an absorbance band for~~ has a first absorbance ratio for an interfering substance potentially present in ~~said~~ the biological fluid and ~~said~~ the second glucose absorbance band ~~includes a second absorbance band~~ has a second absorbance ratio for ~~said~~ the interfering substance, wherein the first and second absorbance ratios are different from each other.

67. (Currently Amended) The method of claim 66, wherein ~~said transmitted mid infrared radiation further comprises~~ a third glucose absorbance band is selected.

68. (Currently Amended) The method of claim 66, wherein ~~said~~ the interfering substance is lactate.

69. (Currently Amended) The method of claim 57, wherein ~~said~~ the biological fluid is capillary filtrate fluid, ~~said~~ the capillary filtrate fluid is transported from a subcutaneous location to ~~said~~ the sample ~~cell~~ container, ~~said~~ the capillary filtrate fluid is passed through an ultrafiltration membrane that allows passage of organics of less than 3000 molecular weight and wherein ~~said~~ the detected radiation contains glucose absorbance bands in a region from 1200 cm^{-1} to 950 cm^{-1} [7 to 11 microns].

70-88. (Canceled)